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IMPROVED OPTICAL WINDOW FOR GENERATING WAVEFORMS

BACKGROUND OF THE INVENTION

The present disclosure is related to the field of optical devices, and more

10 specifically to a wheel for use in generating a waveform.

Devices, such as computer mice, use opto-mechanical schemes to generate electrical waveforms which correspond to the movement of some element of the system. Other devices utilizing optics to generate a waveform are known in the automotive and manufacturing fields. Applications in these fields correlate wheel

15 rotation to movement, e.g., rotation of an engine shaft.

In a mouse, for example, light emitted from a light source is detected by a detector. A stroboscopic wheel is interposed therebetween, such that the light passes through windows in the wheel.

The wheel is driven by mechanical contact with the mouse ball, and the

20 pulses of light received by the receptor can be correlated with the speed of the ball, a reflection of the speed of the mouse itself. These pulses can then be integrated with respect to time to establish displacement of the mouse.

Ideally, a waveform corresponding to mouse displacement would be a perfect square wave. In such a perfect wave, voltage would rise instantaneously, dwell at

25 maximum voltage for a finite period of time, then fall instantaneously to a minimum voltage where it would remain for a finite time before starting the process anew. In actual devices, waveforms are imperfect and are, at best, approximately sinusoidal. Considerable electronic circuitry is expended in filtering out noise and "squaring up" the signal so that it contains a sharp, readily discernable rising and falling edge.

30 The present invention addresses this and other problems associated with the prior art. The invention will become more readily apparent from the following Detailed Description, which proceeds with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

35 FIG. 1 is a perspective view of a portion of the internal components art optical mouse pointing device.